

Submission to the Senate Select Committee on the National Broadband Network by Allan Horsley, FIEAust.

This submission addresses the matters of

**Network Architecture,
Network Performance Criteria, and
Quality of Service Standards,**

that should be included in the Legislation establishing or Regulations relating to the National Broadband Network and the NBN Company.

The submission also addresses matters relating to,

**The active termination equipment, the Network Termination
Unit, located at the End User Premises by NBN Co,**

that should also be included in the Legislation establishing or Regulations relating to the National Broadband Network and the NBN Company .

The submission is made by Allan Horsley, FIEAust, as a private individual, a person with some 45 years of experience in the Australian telecommunications industry in design, operational, representative and regulatory roles.

Background

Government public announcements have outlined the great importance and significance that is being placed upon and being expected of the new National Broadband Network, (NBN).

The expectations of potential users of the NBN have thus been set extremely high.

An expectation of high quality services equivalent to or better than those currently supplied has developed among Business users large and small, as well as Government end users, including Defence, Security and Emergency Services. Residential end users would expect a service that is an improvement upon the current when connected via the NBN which is a contrast to the 'Best Efforts' service culture of the Internet.

The Applications Service Providers which expect to deliver a wide range of services to customers also now understand from Government that the quality of service delivered over the NBN will be very high enabling them to deliver excellent service quality to their customers.

For these reasonable expectations to be met a number of Architecture, Performance and Service matters must be included in Legislation and in supplementary Regulations.

Legislative proposals

(1) Critical National Infrastructure.

Given the significant expectations that have been set for the derived services and the national importance attributed to the NBN, it is **proposed that the Legislation** declare the NBN, '**Critical National Infrastructure**' and that Government take the necessary steps to meet all the requirements of and be afforded all protection necessary to enable such infrastructure.

(2) Network Architecture and Performance Criteria.

In order for the service expectations of the users of the NBN to be met the Government must be confident that NBN Co will build and operate the NBN in a way which will deliver to the end users the expected highly reliable and available services. To do this it is essential for the NBN to have an appropriate high quality and robust Network Architecture complete with clear and measurable Network Performance Criteria.

A Network Architecture would of necessity be expected to be of three layers,

a **Primary Layer** comprising Ethernet Access Switches, several of which could be located in the Capital City of each State and Territory and multiple Optical Fibre transmission links interconnecting the Ethernet Access Switches,

a **Secondary Layer** comprising Ethernet Access Switches located at strategic metropolitan and regional centres connected to appropriate Capital City Ethernet Access Switches by multiple Optical Fibre transmission links,

a **Tertiary Layer** Comprising Fibre Distribution Hubs (connected by optical fibre cable to the nearby Secondary Layer Ethernet Access Switch) and associated Optical Fibre Customer Access Networks, spread throughout Australia, connecting individual customers to the NBN.

It is therefore **proposed that the Legislation;**

for the Primary Layer of the NBN

- require the Primary Layer of the NBN be designed to be able to withstand a fourth contingency failure, i.e. the loss of up to four individual elements of Switches and/or Transmission Links at any one time without loss of service continuity for any user of the NBN.
- require any service connection point in the Primary Layer of the NBN to have a Service Availability of 99.9999%. i.e. outages totalling no more than 30 seconds in any year.

for the Secondary Layer of the NBN

- require the Secondary Layer of the NBN be designed to be able to withstand a second contingency failure, i.e. the loss of up to two individual elements of Switches and/or Transmission Links in a Metropolitan or Regional part of the NBN without loss of service continuity for any user of the NBN.
- Require any service connection point in any Metropolitan and Regional element of the Secondary Layer of the NBN to have a Service Availability of 99.999%. i.e. outages totalling no more than 320 seconds in any one year.

It is also **proposed that the Legislation** require the development of appropriate Regulations by the Australian Communications and Media Authority,

- to establish rules covering the service performance and availability of the Network Elements comprising the Tertiary Layer of the NBN.
- to establish an appropriate monitoring and reporting arrangement to ensure Government and the community are fully informed on the service performance of the NBN, reporting each six months for the first five years of full network operation and then each twelve months thereafter if service quality is considered to have been generally satisfactory in the initial five years.

(3) Quality of Service Criteria

Users who connect to the NBN, whether suppliers of service applications or end users of NBN services, wholesale or retail, require for certainty a detailed description of the Quality of Service characteristics of each type of service, at each different type of point of interconnection and/or connection.

This information is necessary for users to be able to evaluate the service characteristics of any service being used and for them to be able to hold the supplier accountable.

It is therefore **proposed that the Legislation** require the Australian Communications and Media Authority establish an appropriate set of comprehensive Quality of Service Characteristics for each of the generally available services delivered by the National Broadband Network.

(4) Network Termination at an End User Premises.

The traditional or standard device that is connected to a telephone line at a premise is a telephone hand set which is powered via a central battery using electric current delivered over the telephone line.

Hands free telephones, fax machines and both low speed and high speed data modems, for example, as well as the termination units for a subscription television service require a mains electricity supply to operate correctly.

In the event of a mains electricity failure they will cease to function.

In contrast the traditional or standard telephone handset continues to operate even when the local mains electricity has failed.

As a consequence members of the Australian community have the very clear expectation their telephone service will operate at a time of local mains electricity failure.

Furthermore the Commonwealth and State Governments have recently established arrangements which provide for emergency information telephone calls to be made to the homes of people threatened by natural disasters.

Individual members of the community as users and Government will reasonably expect that any basic telephone service that may be made available directly from the National Broadband Network Termination Unit and located at customers' premises will function at a time of mains power failure.

For this reasonable, high and critical expectation to be met, the active Network Termination Unit must have an alternate electric current source to the mains electricity supply.

A battery directly connected to the low voltage supply of the NTU and charged by its power pack or an Uninterrupted Power Supply supplying electric current to the NTU power pack are two practical and well tested ways of ensuring the NTU and the telephone service it provides is functional at the time of a mains electricity failure.

It is therefore **proposed the Legislation** require that each premises NTU in the National Broadband Network be supported by an electric current supply independent of the normal mains electricity supply and that it have a capability to support the NTU and its basic telephone service for a period of **at least 10 hours** and that the end user be responsible for the funding and/or provision of the alternate power supply and for its ongoing maintenance.